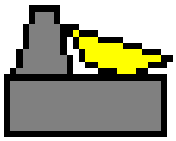
Evaluation and visualisation of plastic and liquid limits to German Standard DIN 18122 (Part 1)

GGU-ATTERBERG

VERSION 5



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1 Preface

The **GGU-ATTERBERG** program allows evaluation and visualisation of tests to determine consistency limits to DIN 18122 (Part 1). Select between DIN, ASTM and British Standard (BS 5930:1999) for visualisation of the plasticity diagram.

Data input is in accordance with conventional WINDOWS operations and can therefore be learned almost entirely without the use of a manual. Graphic output supports the true-type fonts supplied with WINDOWS, so that excellent layout is guaranteed. Colour output and any graphics (e.g. files in formats BMP, JPG, PSP, TIF, etc.) are supported. DXF files can also be imported by means of the integrated Mini-CAD module (see the "**Mini-CAD**" manual).

The program has been thoroughly tested. No faults have been found. Nevertheless, liability for completeness and correctness of the program and the manual, and for any damage resulting from incompleteness or incorrectness, cannot be accepted.

2 Licence protection and installation

In order to guarantee a high degree of quality, a hardware-based copy protection system is used for the **GGU-ATTERBERG** program.

The GGU software protected by the ***CodeMeter*** copy protection system is only available in conjunction with the ***CodeMeter stick*** copy protection component (hardware for connection to the PC, "***CM stick***"). Because of the way the system is configured, the protected software can only be operated with the corresponding CM stick. This creates a fixed link between the software licence and the CM stick copy protection hardware; the licence as such is thus represented by the CM stick. The correct Runtime Kit for the CodeMeter stick must be installed on your PC.

Upon start-up and during running, the **GGU-ATTERBERG** program checks that a CM stick is connected. If it has been removed, the program can no longer be executed.

For installation of GGU software and the CodeMeter software please refer to the information in the ***Installation notes for GGU Software International***, which are supplied with the program.

3 Language selection

GGU-ATTERBERG is a bilingual program. The program always starts with the language setting applicable when it was last ended.

The language preferences can be changed at any time in the "**?**" menu, using the menu item "**Spracheinstellung**" (for German) or "**Language preferences**" (for English).

4 Starting the program

After starting the program, you will see two menus at the top of the window**:**

- File
- ?

After clicking on the "**File**" menu, a previously entered test can be loaded by means of the "**Load**" menu item, or a new one created using "**New**". An example from DIN 18122 is saved as a file ("**ATTERBER-e.ztd**") on the disk. The DIN example is, unfortunately, erroneous. The file contains the corrected version.

After clicking on "**File/New**" an empty form in accordance with German Standard DIN 18122 is shown on the screen. Five menus now appear at the top of the window:

- File
- Edit
- Graphics preferences
- Output preferences
- ?

After clicking one of these menus, the so-called menu items roll down, allowing you access to all program functions.

The program works on the principle of ***What you see is what you get***. This means that the screen presentation represents, overall, what you will see on your printer. In the last consequence, this would mean that the screen presentation would have to be refreshed after every alteration you make. For reasons of efficiency and as this can take several seconds for complex screen contents, the **GGU-ATTERBERG** screen is not refreshed after every alteration.

If you would like to refresh the screen contents, press either [**F2**] or [**Esc**]. The [**Esc**] key additionally sets the screen presentation back to your current zoom, which has the default value 1.0, corresponding to an A4 format sheet.

5 Description of menu items

5.1 File menu

5.1.1 "New" menu item

All input data will be deleted after a security request. After this, you can enter new tests.

5.1.2 "Load" menu item

You can load a file with test data, which was created and saved at a previous sitting, and then edit the test data.

5.1.3 "Save" menu item

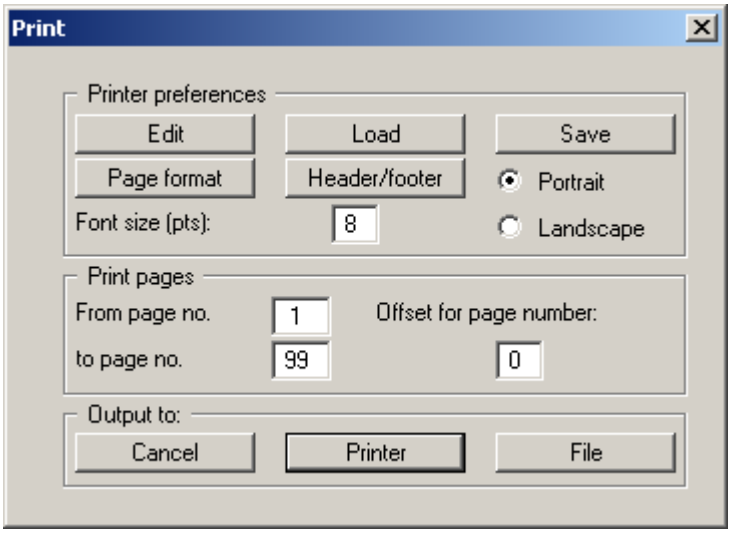
You can save data entered or edited during program use to a file, in order to have them available at a later date, or to archive them. The data is saved without prompting with the name of the current file.

5.1.4 "Save as" menu item

You can save data entered during program use to an existing file or to a new file, i.e. using a new file name. For reasons of clarity, it makes sense to use "**.ztd**" as file suffix, as this is the suffix used in the file requester box for the menu item "**File/Load**". If you choose not to enter an extension when saving, "**.ztd**" will be used automatically.

5.1.5 "Print 'simple' output table" menu item

You can have a result output table of the current test data sent to the printer or save it to a file for further processing using a different program, e.g. a word processing application. You will see the following dialogue box for specifying the simple table output:



- "**Printer preferences**" group box
  Using the "**Edit**" button the current printer preferences can be changed or a different printer selected. Using the "**Save**" button, all preferences from this dialogue box can be saved to a file in order to have them available for a later session. If you select "**GGU-ATTERBERG.drk**" as file name and save the file in the program folder (default), the file will be automatically loaded the next time you start the program.

  Using the "**Page format**" button you can define, amongst other things, the size of the left margin and the number of rows per page. The "**Header/footer**" button allows you to enter a header and footer text for each page. If the "#" symbol appears within the text, the current page number will be entered during printing (e.g. "***Page*** #"). The text size is given in "**Pts**". You can also change between "**Portrait**" and "**Landscape**" formats.

- "**Print pages**" group box
  If you do not wish pagination to begin with "***1***" you can add an ***offset number*** to the check box. This offset will be added to the current page number. The output range is defined using "**From page no.**" "**to page no.**".

- "**Output to:**" group box
  Start output by clicking on "**Printer**" or "**File**". The file name can then be selected from or entered into the box.

5.1.6 "Export to ASCII" menu item

The test data can be exported to an ASCII file, allowing processing in other applications.

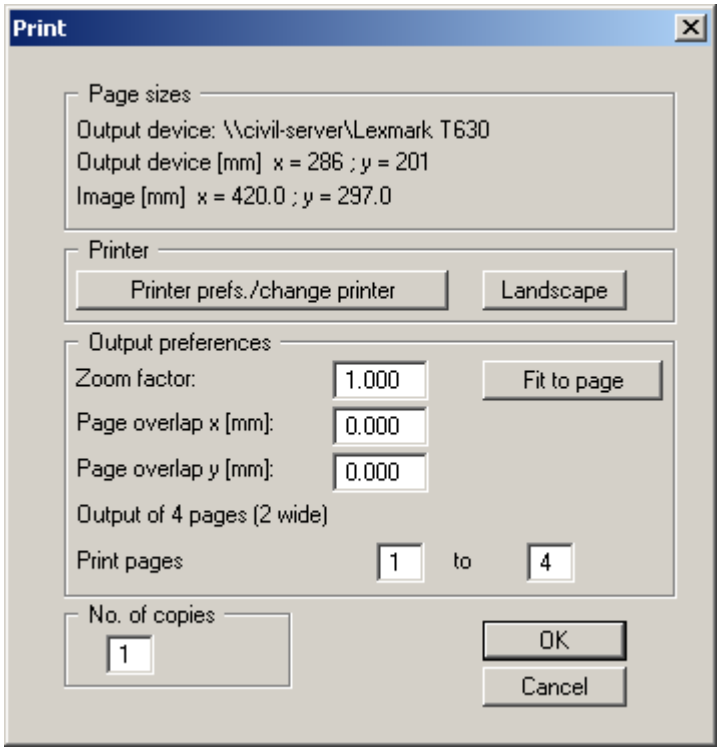
5.1.7 "Printer preferences" menu item

You can edit printer preferences (e.g. swap between portrait and landscape) or change the printer in accordance with WINDOWS conventions.

5.1.8 "Print and export" menu item

You can select your output format in a dialogue box. You have the following possibilities:

- "**Printer**"
  allows graphic output of the current screen contents (***graphical representation***) to the WINDOWS default printer or to any other printer selected using the menu item "**File/Printer preferences**". But you may also select a different printer in the following dialogue box by pressing the "**Printer prefs./change printer**" button.



  In the upper group box, the maximum dimensions which the printer can accept are given. Below this, the dimensions of the image to be printed are given. If the image is larger than the output format of the printer, the image will be printed to several pages (in the above example, 4). In order to facilitate better re-connection of the images, the possibility of entering an overlap for each page, in x and y direction, is given. Alternatively, you also have the possibility of selecting a smaller zoom factor, ensuring output to one page ("**Fit to page**" button). Following this, you can enlarge to the original format on a copying machine, to ensure true scaling. Furthermore, you may enter the number of copies to be printed.

- "**DXF file**"
  allows output of the graphics to a DXF file. DXF is a common file format for transferring graphics between a variety of applications.

- "**GGUCAD file**"
  allows output of the graphics to a file, in order to enable further processing with the **GGUCAD** program. Compared to output as a DXF file this has the advantage that no loss of colour quality occurs during export.

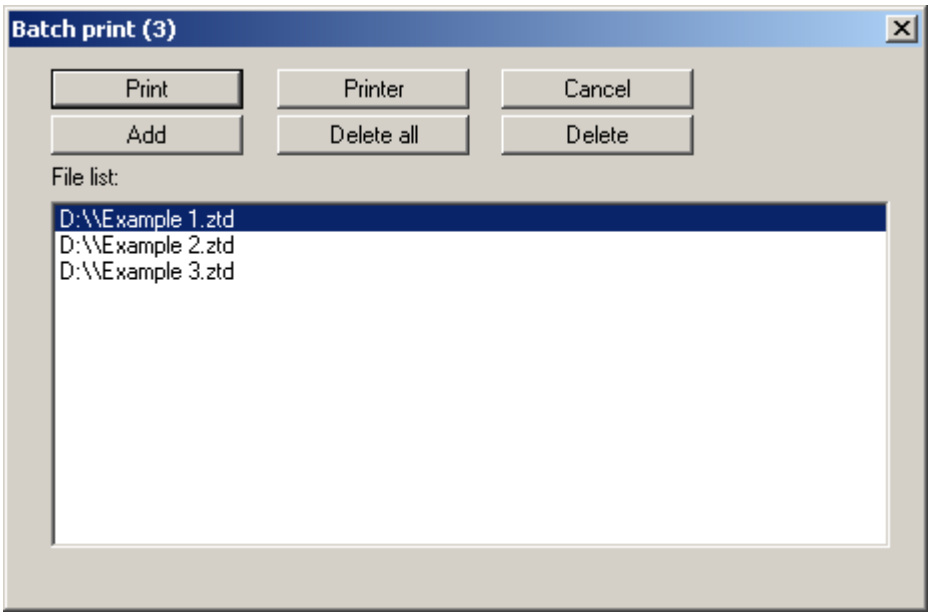
- "**Clipboard**"
  The graphics are copied to the WINDOWS clipboard. From there, they can be imported into other WINDOWS programs for further processing, e.g. into a word processor. In order to import into any other WINDOWS program you must generally use the "*Edit/Paste*" function of the respective application.
- "**Metafile**"
  allows output of the graphics to a file in order to be further processed with third party software. Output is in the standardised EMF format (Enhanced Metafile format). Use of the Metafile format guarantees the best possible quality when transferring graphics.

> If you select the "**Copy/print area**" tool from the toolbar, you can copy parts of the graphics to the clipboard or save them to an EMF file. Alternatively you can send the marked area directly to your printer (see "**Tips and tricks**", Section 6.3).
>
> Using the "**Mini-CAD**" program module you can also import EMF files generated using other GGU applications into your graphics.

- "**MiniCAD**"
  allows export of the graphics to a file in order to enable importing to different GGU applications with the **Mini-CAD** module.
- "**GGUMiniCAD**"
  allows export of the graphics to a file in order to enable processing in the **GGUMiniCAD** program.
- "**Cancel**"
  Printing is cancelled.

5.1.9 "Batch print" menu item

If you would like to print several appendices at once, select this menu item. You will see the following dialogue box:



Create a list of files for printing using "**Add**" and selecting the desired files. The number of files is displayed in the dialogue box header. Using "**Delete**" you can mark and delete selected individual files from the list. After selecting the "**Delete all**" button, you can compile a new list. Selection of the desired printer and printer preferences is achieved by pressing the "**Printer**" button.

You then start printing by using the "**Print**" button. In the dialogue box which then appears you can select further preferences for printer output such as, e.g., the number of copies. These preferences will be applied to all files in the list.

5.1.10 "Exit" menu item

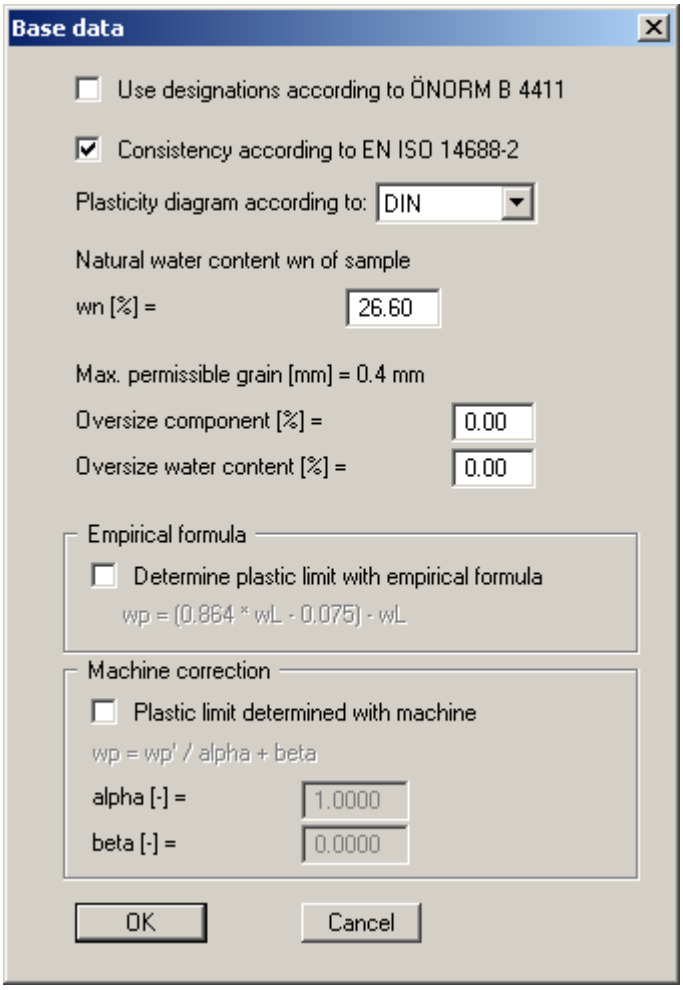
After a confirmation prompt, you can quit the program.

5.1.11 "1, 2, 3, 4" menu items

The "**1, 2, 3, 4**" menu items show the last four files worked on. By selecting one of these menu items the listed file will be loaded. If you have saved files in any other folder than the program folder, you can save yourself the occasionally onerous ***rummaging*** through various sub-folders.

5.2.1 "Base data" menu item

After selecting this menu item the following dialogue box appears:



You can specify whether to use the **ÖNORM B 4411** designations on the output sheet. By activating the appropriate check box when evaluating the consistency, evaluation can be performed according to the new **EN ISO 14688-2**.

Select from various standards for plasticity diagram visualisation using the arrow of the drop-down list. The **DIN** visualisation is used by default; however, it is also possible to select visualisation according to the requirements of the **ASTM** (***A**merican **S**ociety for **T**esting and **M**aterials*). In addition,visualisation according to the requirements of **BS 5930** (***B**ritish **S**tandard*, 1999 edition) is also possible.

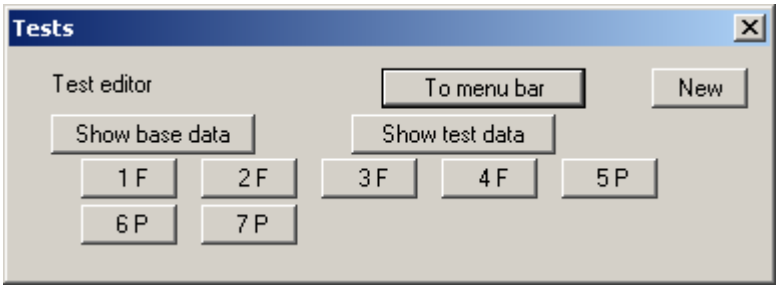
Enter the natural water content of the sample and, if available, the oversize grain component and its water content (each in %) into the three data boxes.

It is also possible to determine the plastic limit using an empirical equation. If this check box is activated it is not necessary to enter data for the plastic limit. The plastic limit is then determined from the liquid limit by means of the given equation. The equation used should be treated with caution.

If you have determined the plastic limit using a machine, you activate the "**Plastic limit determined with machine**" check box. Additionally, a machine-dependent corrections "**alpha**" and "**beta**" can be entered.

5.2.2 "Tests" menu item

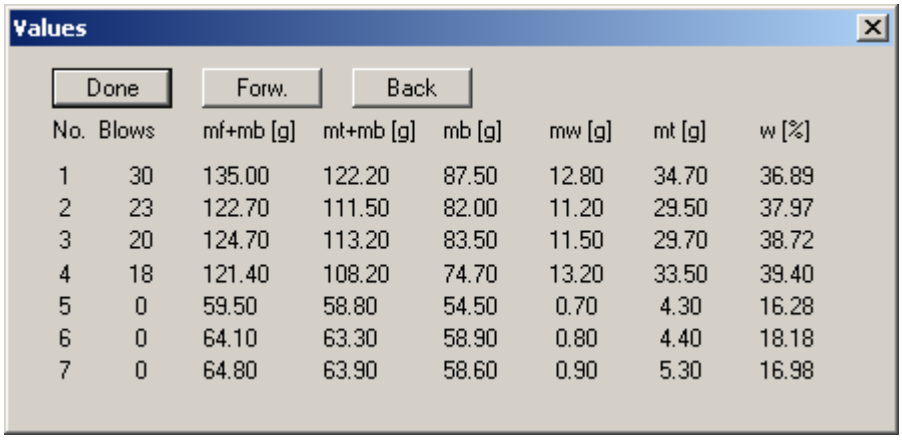
This point represents the program's central menu item. Almost all the test data are entered here. As an example, after clicking this menu item the following dialogue box opens:



Seven tests are already present in this example. The tests are automatically numbered and the test numbers ("1, 2, 3, ...") shown on the respective buttons. The suffix "**F**" or "**P**" designates a test for determination of the liquid (Flow) limit or the plastic (Plastic) limit respectively. The following actions are possible:

- "**To menu bar**"
  You return to the original menu bar.
- "**New**"
  You will create a new test in order to enter the appropriate data (see below).
- "**Show base data**"
  The test data corresponding to any entered single tests are computed and displayed in an info box. The same data are shown on the output sheet in the "**Water content, etc.**" element (see Section 5.4.14).

- "**Show test data**"
  The water content data for the tests will be calculated and displayed, together with all input data, e.g.:



No.	Blows	mf+mb [g]	mt+mb [g]	mb [g]	mw [g]	mt [g]	w [%]
1	30	135.00	122.20	87.50	12.80	34.70	36.89
2	23	122.70	111.50	82.00	11.20	29.50	37.97
3	20	124.70	113.20	83.50	11.50	29.70	38.72
4	18	121.40	108.20	74.70	13.20	33.50	39.40
5	0	59.50	58.80	54.50	0.70	4.30	16.28
6	0	64.10	63.30	58.90	0.80	4.40	18.18
7	0	64.80	63.90	58.60	0.90	5.30	16.98

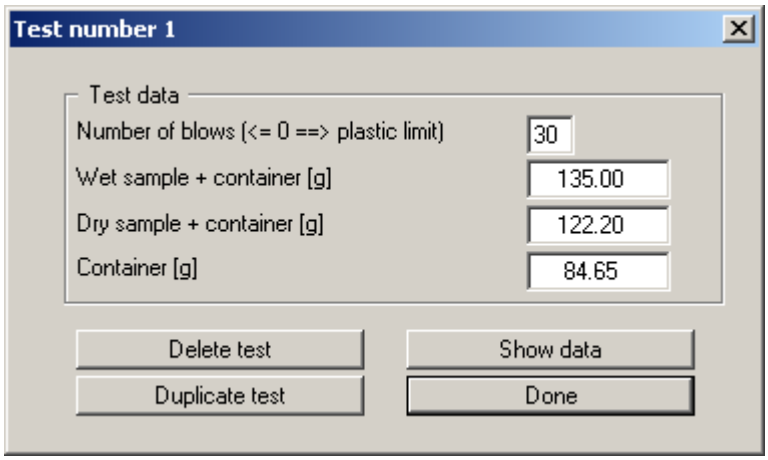
  The test data can also be shown on the output sheet in table format if the corresponding element is activated (see "**Output preferences/Table**", Section 5.4.15).

- "**1F**", "**2F**", ...,"**5P**", "**6P**",...
  By pressing the appropriate button, you can edit or check the data for a particular test.

If only one individual test is entered for liquid limit determination, the program will evaluate with the one-point method in accordance with German Standard DIN 18122 . For this, the blow count must be between 15 and 35. Otherwise an error message will appear. In the blow diagram, only one value is displayed, without a best-fit line. Additionally, a note is given in the diagram that this was a one-point test.

The evaluation of the plastic limit is in accordance with the notes in DIN 18122 . This states that only tests which do not differ in their water content by a maximum of 2% may be evaluated. If, after this criterion has been applied, less than three tests remain for determination of the plastic limit, a warning message will be given. For machine determination of the plastic limit, this warning message is suppressed.

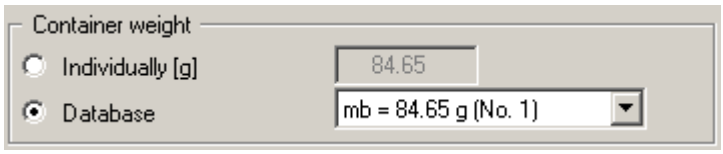
After clicking on "**New**" or on the button of an existing test a dialogue box opens for entering or editing test data.



The following input or actions can be carried out:

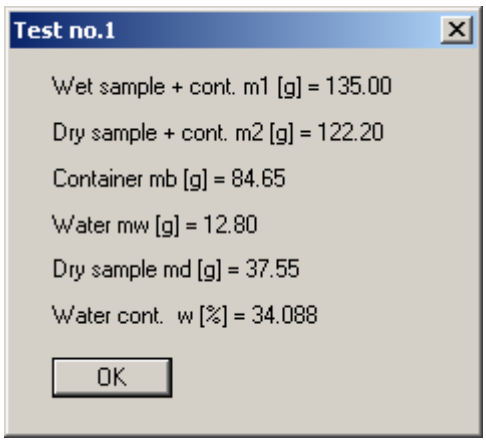
- "**Test data**" group box
  You first enter the number of blows. If you enter a blow count of "**0**" or a negative value, this will designate a test for determination of the plastic limit. Otherwise, the following data will be used for liquid limit determination.

  Enter the weights of the sample and the container in the remaining input boxes of the group box to determine the water content. It is also possible to enter the weight of the test container manually. However, if you use containers with standard weights for your tests it is recommended to store the weights of the respective containers in a database. This saves repeated input by hand. The database can be stored using the menu item "**Edit/Container database**" (see Section 5.2.7). In the place of the input box "**Container [g]**" an extended group box is shown in the dialogue box. After activating the "**Database**" option button the containers used can be selected from the drop-down combo box.



> The container database can also be accessed when using other GGU laboratory programs.

- "**Delete test**"
  The currently displayed test will be deleted.
- "**Duplicate test**"
  The currently displayed test will be duplicated. You will automatically find yourself in the next test.
- "**Show data**"
  Result data (water content etc.) for the current test will be calculated and displayed in a dialogue box.


Test no.1
Wet sample + cont. m1 [g] = 135.00
Dry sample + cont. m2 [g] = 122.20
Container mb [g] = 84.65
Water mw [g] = 12.80
Dry sample md [g] = 37.55
Water cont. w [%] = 34.088
OK

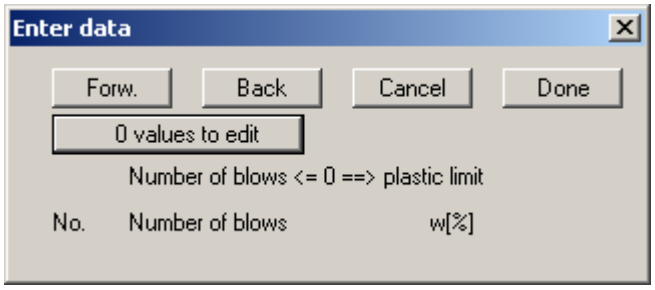
- "**Done**"
  You will arrive back at the previous dialogue box. All values entered will be accepted.

5.2.3 "Delete all tests" menu item

After a security request, all tests will be deleted. After this, you can enter a new test using the "**Edit/Tests**" menu item (see Section 5.2.2).

5.2.4 "Test data input via editor" menu item

Beside the test data input described above, where the water content is determined by the program, test data can also be entered directly in an editor. The following dialogue box opens after a confirmation prompt:



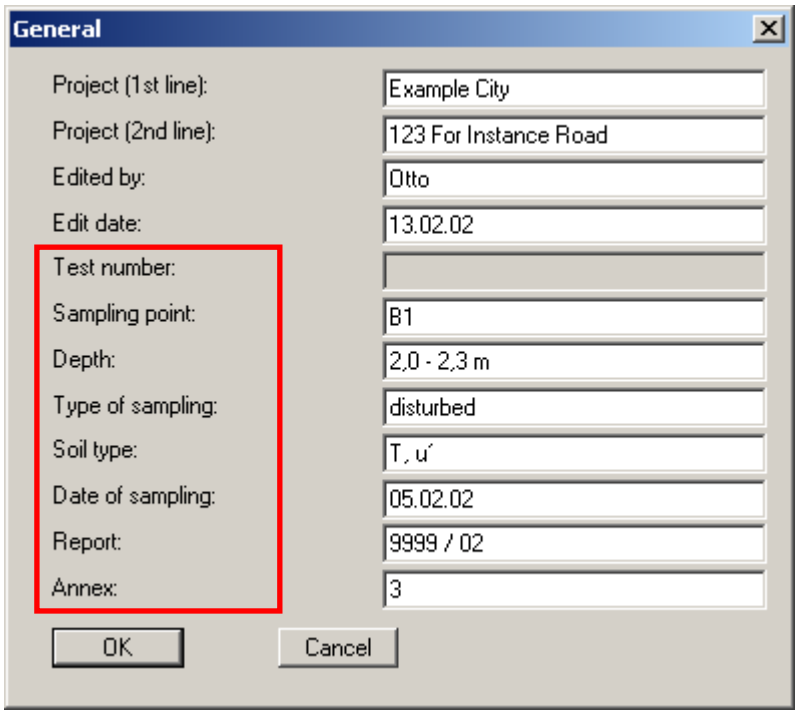
First select the "**x values to edit**" button and enter the number of values to be edited (e.g. "**3**"). You can then enter the three value pairs (blow count and corresponding water content). Here too, a blow count of ≤ 0 designates a plastic limit. After selecting the "**Done**" button, the test results will be graphically displayed.

The dialogue box shows a maximum of 8 value pairs simultaneously. If more than 8 value pairs have been entered you can move through the table with the "**Forw.**" and "**Back**" buttons. Existing data pairs can be deleted from the end of the list by reducing the number of entries, but a minimum of two data pairs must remain. The data pairs entered using this menu item are deleted following a confirmation prompt when you go to the menu item "**Edit/Tests**" for a second time.

If only one individual test is entered for liquid limit determination, the program will evaluate with the one-point method in accordance with German Standard DIN 18122 . For this, the blow count must be between 15 and 35. Otherwise an error message will appear. In the blow diagram, only one value is displayed, without a best-fit line. Additionally, a note is given in the diagram that this was a one-point test.

5.2.5 "General" menu item

Go to this menu item to enter general data such as the project identification, report number, annex number, etc. This data is displayed in the correct elements of the output sheet.



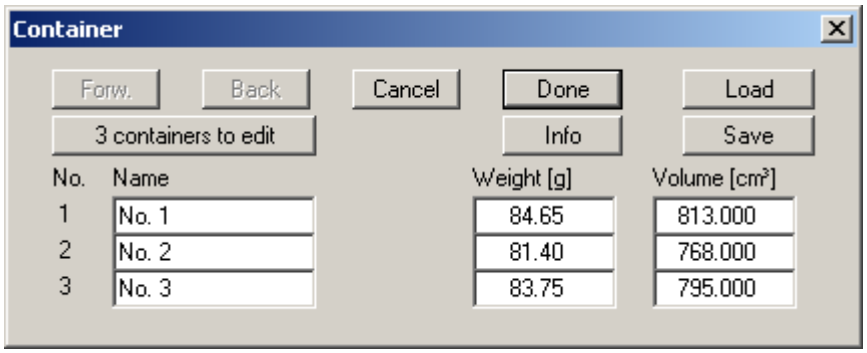
The marked texts in the dialogue box also appear in the output sheet. Input boxes can be altered or switched off such as "**Test number:**" as shown in the above dialogue box by going to the menu item "**Output preferences/Texts**" (see Section 5.4.3).

5.2.6 "Company" menu item

You can enter your company address in four lines. These lines will be entered at the top left of the form.

5.2.7 "Container database" menu item

If you use containers with standard weights for your tests, their weights can be stored in a container database using the dialogue box in this menu item.



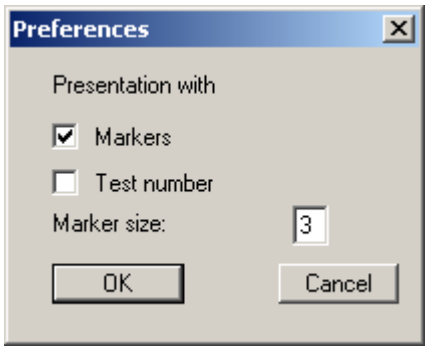
Enter the number of containers to be defined via the "**x containers to edit**" button. The corresponding number of rows for input will then be shown. If more than 8 containers are defined you can navigate through the list using the "**Forw.**" and "**Back**" buttons.

If you work with several databases you can save the containers to a database or load a different database using the appropriate buttons. The database file is first searched for in the program folder, then at the working level and finally in the Windows folder. It is generally practical to store the container database in the Windows folder if it is also to be accessed by other GGU laboratory programs. If the database file is saved using the default name of "**GGU-Database.bh_**" it is automatically loaded when the program starts. This information is also stored behind the "**Info**" button.

The containers stored in the database can be accessed in a drop-down combo box in the menu item "**Edit**/**Tests**" (see Page 14).

5.3.1 "Preferences" menu item

After selecting this menu item a dialogue box appears, in which you can edit preferences for graphical visualisation.

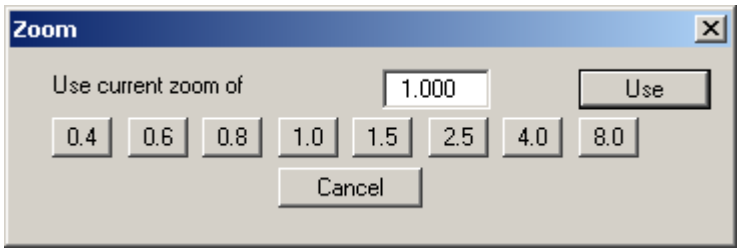


Activating the corresponding check boxes you decide whether markers or test numbers are to be entered at the blow diagram points. If neither of the two check boxes is selected, the values will not be marked. The marker size is user-defined.

5.3.2 "Refresh and zoom" menu item

The program works on the principle of ***What you see is what you get***. This means that the screen presentation represents, overall, what you will see on your printer. In the last consequence, this would mean that the screen presentation would have to be refreshed after every alteration you make. For reasons of efficiency and as this can take several seconds for complex screen contents, the screen is not refreshed after every alteration.

If, e.g., after using the zoom function (see below), only part of the image is visible, you can achieve a complete view using this menu item.



A zoom factor between 0.4 and 8.0 can be entered in the input box. By then clicking on "**Use**" to exit the box the current factor is accepted. By clicking on the "**0.4**", "**0.6**", etc. buttons, the selected factor is used directly and the dialogue box closed.

It is much simpler, however, to get a complete overview using [**Esc**]. Pressing [**Esc**] allows a complete screen presentation using the zoom factor specified in this menu item. The [**F2**] key allows screen refreshing without altering the coordinates and zoom factor.

5.3.3 "Zoom info" menu item

By clicking two diametrically opposed points you can enlarge a section of the screen in order to view details better. An information box provides information on activating the zoom function and on available options.

5.3.4 "Legend font selection" menu item

With this menu item you can switch to a different true-type font. All available true-type fonts are displayed in the dialogue box.

5.3.5 "Font size selection" menu item

You can edit font sizes of texts [in mm] within the various input areas.

5.3.6 "Mini-CAD toolbar" menu item

Using this menu item you can add free text to the graphics and add lines, circles, polygons and images (e.g. files in formats BMP, JPG, PSP, TIF, etc.). A pop-up menu opens; the icons and functions used are described in more detail in the "**Mini-CAD**" manual provided.

5.3.7 "Toolbar preferences" menu item

After starting the program a horizontal toolbar for menu items appears below the program menu bar. If you would rather work with a popup window with several columns, you can specify your preferences using this menu item. The smarticons can also be switched off.

At the bottom of the program window you find a status bar with further information. You can also activate or switch off the status bar here. The preferences will be saved in the "**GGU-ATTERBERG.alg**" file (see menu item "**Graphics preferences/Save graphics preferences**") and will be active at the next time the program is started.

By clicking on the tools (smarticons) you can directly reach most of the program functions. The meaning of the smarticons appears as a text box if you hover with the mouse pointer over the tools. Some of the tool functions can be activated from the normal menu items.

"**Zoom out**"
If you have previously ***zoomed in***, this tool returns to a full screen display.

"**Zoom (-)**"/"**Zoom (+)**"
With the zoom functions you can zoom in or out of parts of the image, by clicking the left mouse button.

"**Undo move object**"
If you have previously edited the position or size of an element on the output sheet ([**F11**] or used "**Output preferences/Move objects**"), you can undo the last changement with this tool.

"**Restore move object**"
If you have previously undone a changement, you can restore with this tool.

"**Copy/print area**"
Use this tool to copy only parts of the graphics in order to paste them, e.g. to a report. You will see information on this function and can then mark an area, which is copied to the clipboard or can be saved in a file. Alternatively you can send the marked area directly to your printer (see "**Tips and tricks**", Section 6.3).

5.3.8 "Load graphics preferences" menu item

You can reload a graphics preferences file into the program, which was saved using the "**Graphics preferences/Save graphics preferences**" menu item. Only the corresponding data will be refreshed.

5.3.9 "Save graphics preferences" menu item

Some of the preferences you made with the menu items of the "**Graphics preferences**" menu as well as the inputs using the "**Edit/Company**" menu item can be saved to a file. If you select "**GGU-ATTERBERG.alg**" as file name, and save the file on the same level as the program, the data will be automatically loaded the next time the program is started and need not be entered again.

> If you do not go to "**File/New**" upon starting the program, but open a previously saved file instead, the preferences used at the time of saving are shown. If subsequent changes in the general preferences are to be used for existing files, these preferences must be imported using the menu item "**Graphics preferences/Load graphics preferences**".

5.4 Output preferences menu

5.4.1 General note

The DIN 18122 makes no suggestions for presentation of test results. It has become common practice, however, to use the following presentations:

- Blow diagram;
- Text with test results;
- Consistency;
- Plasticity range;
- Plasticity diagram after Casagrande.

In addition to these elements, which are relevant to test evaluation only, further elements are also used in the visualisation:

- Title;
- Company;
- Test no., etc.;
- Annex and report;
- Table.

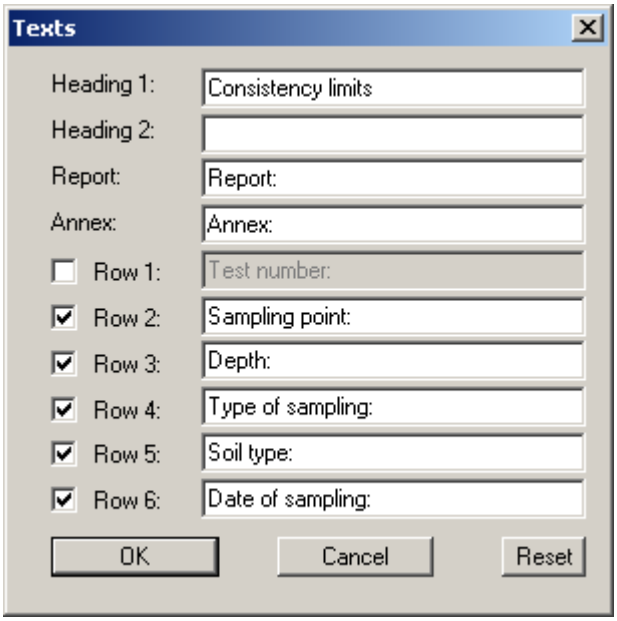
The output sheet can be completely redesigned using the items in this menu.

5.4.2 "Page size" menu item

The default page set-up is A4 (portrait) when the program is started. You can edit the page size in the dialogue box.

5.4.3 "Texts" menu item

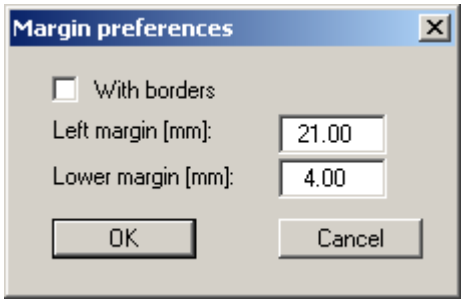
The default labelling of some output sheet elements can be edited in this menu item's dialogue box. Among other things, the name of the output sheet can be specified here.



Your input in rows 1 to 6 of the above dialogue box, as well as the input for "**Report:**" and "**Annex:**" also represent the designations for the input boxes in the "**Edit/General**" menu item dialogue box. If lines are deactivated in the above dialogue box, the corresponding input boxes in the "**Edit/General**" menu item dialogue box are also deactivated (see Section 5.2.5). Use "**Reset**" to restore the default labelling settings.

5.4.4 "Margins" menu item

In the default program preferences the form is shown with cutting borders. For output to an A4 printer, a reduction of the printer output is generally necessary, as proprietary printers cannot fully cover an A4 page. The margin preferences can be defined in the following dialogue box.



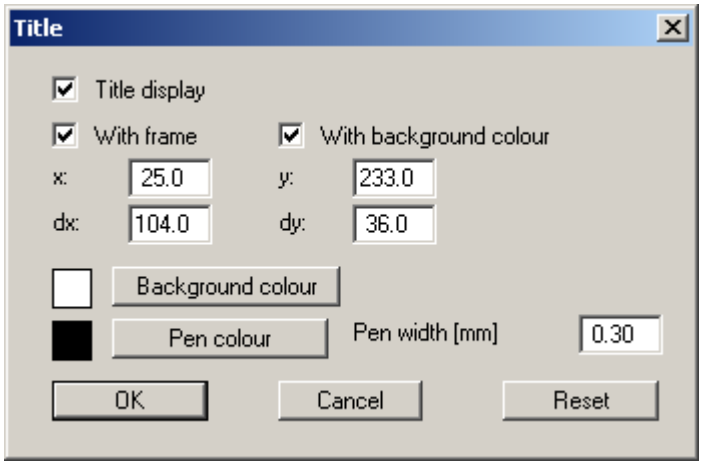
By deactivating the "**With borders**" check box and with an appropriate choice of left and lower margins, it is generally possible to create a non-reduced printer output. It is necessary to also adapt the page height and width (see Section 5.4.2).

5.4.5 "Position info" menu item

The positions and layout of the individual elements on the output sheet can be altered using the following menu items. This menu item provides information on the options for altering the position and layout more quickly using the mouse.

5.4.6 "Title (change position)" menu item

The position and layout of the title element can be altered via the dialogue box for this menu item, if the "**Title display**" check box is activated.



The position of the element on the output sheet and its size can be defined or edited by means of the variables "***x***" and "***y***", "**dx**" and "**dy**". The element can be provided with a frame and a background colour to suit your personal requirements. If the element needs to be returned to its original condition, this can be done using the "**Reset**" button. Alternatively, you can alter the size and shape of the element using the mouse (see menu item "**Output preferences/Move objects**", Section 5.4.17).

The heading "**Consistency limits**" shown in the title element can be edited in the menu item "**Output preferences/Texts**" (see Section 5.4.3). The texts "**Project (1st line)**" and "**Project (2nd line)**" are entered immediately after double-clicking the element or using the menu item "**Edit/General**" (see Section 5.2.5).

5.4.7 "Plasticity diagram" menu item

A dialogue box opens that is almost identical to that for the previous menu item. The same preferences can be specified in this box as in that described in Section 5.4.6. Proceed as described there to alter the position or layout of the "**Plasticity diagram**" element.

5.4.8 "Company" menu item

Almost exactly the same dialogue box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). Simply proceed as described there to edit the "**Company**" element.

The input for this element can be edited immediately after double-clicking on the element or via the menu item "**Edit/Company**" (see Section 5.2.6).

5.4.9 "Test no., etc." menu item

Almost exactly the same dialogue box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Test no., etc.**", element, simply proceed as is described there.

The input for this element can be edited immediately after double-clicking on the element or via the menu item "**Edit/General**" (see Section 5.2.5). For this element you also have the option of adapting the texts in front of the input boxes to suit your needs. Go to the menu item "**Output preferences/Texts**" (see Section 5.4.3).

5.4.10 "Annex and report" menu item

Almost exactly the same dialogue box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Annex and report**" element, simply proceed as described there.

The input for this element can be edited immediately after double-clicking on the element or via the menu item "**Edit/General**" (see Section 5.2.5). For this element you also have the option of adapting the texts in front of the input boxes to suit your needs. Go to the menu item "**Output preferences/Texts**" (see Section 5.4.3).

5.4.11 "Plasticity range" menu item

Almost exactly the same dialogue box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Plasticity range**" element, simply proceed asrange described there.

5.4.12 "Blow diagram" menu item

Almost exactly the same dialogue box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Blow diagram**" element, simply proceed as described there.

5.4.13 "Consistency" menu item

Almost exactly the same dialogue box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Consistency**" element, simply proceed as described there.

5.4.14 "Water content etc." menu item

Almost exactly the same dialogue box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Water content etc.**" element, simply proceed as described there.

5.4.15 "Table" menu item

This element is hidden in the default program setting. The test and result data of all single tests are given in the table. Almost exactly the same dialogue box opens with the same preference options as that described in the "**Output preferences/Title (change position)**" menu item (see Section 5.4.6). To edit the "**Table**" element, activate the "**Table display**" check box.

5.4.16 "Reset all" menu item

With this button, all preferences for the aforementioned elements, which may have been edited with the previous menu item, will be reset to the program defaults.

5.4.17 "Move objects" menu item

When you go to this item you can move the various objects with the aid of the mouse. Move the mouse over the object to be moved. When you are located above a moveable object the mouse pointer appears in the shape of a cross. You can now press and hold the left mouse button and drag the object to the required position.

> After going to this menu item only one object at a time can be moved using the mouse or its size be altered.
>
> In order to move or edit several objects, this function can be more quickly activated by pressing [**F11**] or the icon.

The size of an object can also be altered using this menu item or the [**F11**] key. If you move over the frame of a changeable object after activating this function the mouse assumed the shape of a double-headed arrow. Hold the left mouse button and move the frame until the object has reached the required size. To retain the ratio of the sides, pull at one corner only. If on one side only is pulled the object will become higher or wider.

The last change made in the position or size of an object can be undone using [**Back**] or by clicking the icon.

5.5.1 "Copyright" menu item

You will see a copyright message and information on the program version number.

The "**System**" button shows information on your computer configuration and the folders used by **GGU-ATTERBERG**.

5.5.2 "Maxima" menu item

You will see information on the default program maxima.

5.5.3 "Help" menu item

The **GGU-ATTERBERG** help is opened as a PDF document. The help function can also be accessed using the [**F1**] function key.

5.5.4 "GGU on the web" menu item

Using this menu item you can access the GGU Software website: www.ggu-software.com.
Keep in touch with new program versions and the regular ***download*** offers.

If you would like to be automatically notified about program innovations, please register for the Newsletter in our Knowledge Base. Go to the following website: http://kbase.civilserve.com.

5.5.5 "GGU support" menu item

This menu item takes to the GGU-Software Support area at www.ggu-software.com.

5.5.6 "What's new?" menu item

You will see information on program improvements in comparison to older versions.

5.5.7 "Language preferences" menu item

This menu item allows you to switch the menus and the graphics from German to English and vice versa. To work in German, deactivate the two check boxes "**Dialoge + Menüs übersetzen (translate dialogues, menus)**" und "**Graphiktexte übersetzen (translate graphics)**".

Alternatively, you can work bilingually, e.g. with German dialogue boxes but with graphic output in English. The program always starts with the language setting applicable when it was last ended.

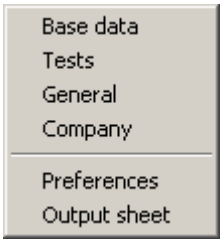
6 Tips and tricks

6.1 Keyboard and mouse

You can scroll the screen with the keyboard using the cursor keys and the [**Page up**] and [**Page down**] keys. By clicking and pulling with the mouse, with [**Ctrl**] pressed, you activate the zoom function, i.e. the selected section will fill the screen. Furthermore you can use the mouse wheel to zoom in/out or scrolling the screen presentation. The following mouse wheel functions are available:

- Mouse wheel up = move screen image up
- Mouse wheel down = move screen image down
- [**Ctrl**] + mouse wheel up = enlarge screen image (zoom in)
- [**Ctrl**] + mouse wheel down = shrink screen image (zoom out)
- [**Shift**] + mouse wheel up = move screen image right
- [**Shift**] + mouse wheel down = move screen image left

If you click the right mouse button anywhere on the screen a context menu containing the principal menu items opens.



By double-clicking the left mouse button on output sheet or **Mini-CAD** objects, the editor for the selected object immediately opens, allowing it to be edited. By double-clicking output sheet elements while holding the [**Shift**] key, the preferences for the position, size and appearance of the element open for editing in the editor.

6.2 Function keys

Some of the function keys are assigned program functions. The allocations are noted after the corresponding menu items. The individual function key allocations are:

- [**Esc**] refreshes the screen contents and sets the screen back to your current zoom, which has the default value 1.0. This is useful if, for example, you have used the zoom function to display parts of the screen and would like to quickly return to a complete overview.
- [**F1**] opens the help file.
- [**F2**] refreshes the screen without altering the current magnification.
- [**F11**] activates the menu item "**Output preferences/Move objects**".

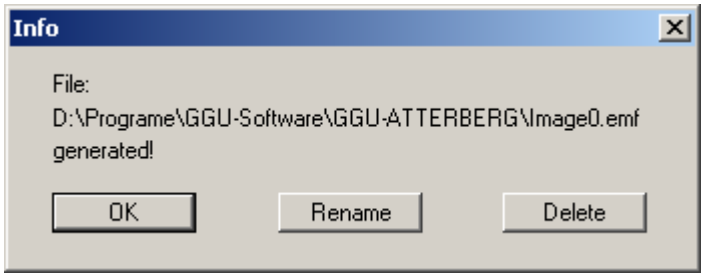
6.3 "Copy/print area" icon

A dialogue box opens when the "**Copy/print area**" icon in the menu toolbar is clicked, describing the options available for this function. For example, using this icon it is possible to either copy areas of the screen graphics and paste them into the report, or send them directly to a printer.

In the dialogue box, first select where the copied area should be transferred to: "**Clipboard**", "**File**" or "**Printer**". The cursor is displayed as a cross after leaving the dialogue box and, keeping the left mouse button pressed, the required area may be enclosed. If the marked area does not suit your requirements, abort the subsequent boxes and restart the function by clicking the icon again.

If "**Clipboard**" was selected, move to the MS Word document (for example) after marking the area and paste the copied graphics using "*Edit/Paste*".

If "**File**" was selected, the following dialogue box opens once the area has been defined:



The default location of the file is the folder from which the program is started and, if several files are created, the file is given the file name "**Image0.emf**" with sequential numbering. If the "**Rename**" button in the dialogue box is clicked, a file selector box opens and the copied area can be saved under a different name in a user-defined folder. Saving can be aborted by pressing the "**Delete**" button.

If the "**Printer**" button was pressed in the first dialogue box, a dialogue box for defining the printer settings opens after marking the area. Following this, a dialogue box for defining the image output settings opens. After confirming the settings the defined area is output to the selected printer.

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